Practice Alert

Medicines that can cause respiratory depression

May 2022

Key points

- Respiratory depression is slow and ineffective breathing. If this happens, a person may not get enough oxygen and this can increase carbon dioxide levels, potentially leading to a medical emergency.
- Some medicines significantly increase the risk of respiratory depression – in particular, medications that affect the central nervous system (CNS), such as benzodiazepines (e.g. diazepam, oxazepam), antipsychotics (e.g. quetiapine), anticonvulsants (e.g. gabapentin, pregabalin), opioids (e.g. oxycodone, codeine), or combinations of medicines that affect the CNS.
- Inappropriate dosing and/or management of sedatives and other CNS medicines can result in respiratory depression.
- Opioids administered at the same time as sedatives or other psychotropic medicines can also increase the risk of respiratory depression.
- Providers must comply with the NDIS Code of Conduct and the NDIS Practice Standards when supporting participants who take medicines which can cause respiratory depression.
- Providers should have emergency plans in place to identify and manage risks to participants. Workers should follow the provider's emergency plan regarding when to call an ambulance or seek medical assistance.

What is respiratory depression?

Respiratory depression is characterised by slow and ineffective breathing and can lead to increased carbon dioxide in the body and reduced oxygen availability.

Respiratory depression is a serious and sometimes life-threatening condition if it is not monitored and managed effectively. Respiratory depression can precede serious cardiovascular conditions such as respiratory arrest (cessation of breathing), cerebral hypoxia (insufficient oxygen to the brain) or respiratory acidosis (high levels of acid in the blood due to increased carbon dioxide in the body), which can lead to premature death.

Respiratory depression can be caused by the side effects of medicines and can result from inappropriate dosing or drug-to-drug. Medicines that can increase the risk of respiratory depression include benzodiazepines such as midazolam or diazepam, particularly when used in combination with other psychotropic medicines such as antidepressants, antipsychotics, anticonvulsants or sedatives such as phenobarbital.

Opioids on their own or in combination with other psychotropic medicines are also associated with a significant risk of respiratory depression. People with a disability may be at an increased risk because of pre-existing physical risks for breathing problems.

Medicines associated with an increased risk of respiratory depression

- **Benzodiazepines** such as midazolam, diazepam (Valium), and lorazepam
- **Opioids** such as oxycodone, codeine, and fentanyl
- **Polypharmacy** with medicines that compromise kidney or liver function
- **Psychotropic polypharmacy** (two or more medicines that affect the CNS (antipsychotics, antidepressants, sedatives and anticonvulsants)
- Combinations of any of the above increase the risk further and increase the risk of drug-to-drug interactions

When is respiratory depression more likely?

Higher rates of medicine-related respiratory depression have been reported in people who:

- are aged over 55 years
- experience obstructive sleep apnoea
- are obese
- have a severely compromised status of health
- have multiple comorbid health conditions
- are prescribed more than one of opioids, benzodiazepines, antipsychotics, antidepressants and other psychotropic drugs
- experience daytime drowsiness
- have impaired kidney or liver function
- are smokers

- have a history of opioid dependence, drink alcohol while taking prescribed opioids.

Supporting participants

Providers can support participants who are prescribed medicines that can cause respiratory depression by being aware of the risks and how to respond in potential emergency situations.

Providers can support participants to make an appointment with their medical practitioner or pharmacist at any time if they report, or are observed experiencing adverse effects due to medicines, particularly if there has been a recent change in medicine. Participants are eligible for medicine reviews with a pharmacist as a way of ensuring their medicine is safe and effective. A medical practitioner can provide the participant with a referral for this medicine review.

If a participant commences taking a new medicine, the prescribing doctor may recommend specific timeframes for review of its effectiveness and potential adverse effects. Providers can also support participants, where appropriate, to follow up on medication review appointments.

Participants taking multiple medicines (or polypharmacy) should be reviewed at least every 3 to 6 months by a medical practitioner or pharmacist Practice Alert: Polypharmacy. This will identify the need for assessment of effectiveness, potential interactions and risk versus benefit profile of all medicine and any associated adverse effects. If the patient is intended to be on a combination of medicines long-term, consider a Home Medication Review (HMR) with a pharmacist who can identify potential interactions between medicines.

You can read more about polypharmacy and medication reviews in the Practice Alert: Polypharmacy.

Emergency Response (requires expert medical review)

Providers should have emergency plans in place to identify and manage risks to participants. Workers should follow the provider's emergency plan regarding when to call an ambulance or seek medical assistance.

Record keeping

Each participant should have current health and medical records that are ready to be taken to hospital should a participant require emergency treatment. This allows doctors and hospital staff to identify current medicines and potential medicine-related adverse events. The participant can obtain their medication history from their regular pharmacy and request a new copy when there is a medication change.

Training

Providers should consider training workers directly involved in the care of participants or residents who require the use of medicines that may cause respiratory depression about:

- the administration of those medicines
- the risks of medicines associated with respiratory depression
- guidelines on how to respond to potential emergencies, particularly related to the use of medicines associated with respiratory depression.

Provider obligations

NDIS Code of Conduct

Providers and workers must comply with the NDIS Code of Conduct when providing supports or services to NDIS participants.

The NDIS Code of Conduct requires all workers and providers who deliver NDIS supports to NDIS participants to, among other things:

- provide supports and services in a safe and competent manner with care and skill
- promptly take steps to raise and act on concerns about matters that might have an impact on the quality and safety of supports provided to people with disability.

NDIS Practice Standards

If you are a registered NDIS provider, you must comply with the NDIS Practice Standards and Quality Indicators as part of your conditions of registration. The NDIS Practice Standards relate to the delivery of safe, quality supports and services, and the management of risks associated with the supports you provide to NDIS participants.

The NDIS Practice Standards that are most relevant to this alert include:

- **Access to supports:** each participant can access the most appropriate supports that meet their needs, goals and preferences.
- **Human resource management:** each participant's support needs are met by workers who are competent in relation to their role, hold relevant qualifications, and who have relevant expertise and experience to provide person-centred support.
- **Incident management:** each participant is safeguarded by the provider's incident management system, ensuring that incidents are acknowledged, responded to, well-managed and learned from.
- **Independence and informed choice:** each participant is supported by the provider to make informed choices, exercise control and maximise their independence relating to the supports provided.
- **Information management:** each participant's information is managed to ensure that it is identifiable, accurately recorded, current and confidential. Each participant's information is easily accessible to the participant and appropriately utilised by relevant workers.
- **Management of medicine:** each participant requiring medicine is confident their provider administers, stores and monitors the effects of their medicine and works to prevent errors or incidents.
- **Responsive support provision:** each participant can access responsive, timely, competent and appropriate supports to meet their needs, desired outcomes and goals.
- **Risk management:** risks to participants, workers and the provider are identified and managed.
- **Safe environment:** each participant accesses supports in a safe environment that is appropriate to their needs.

- **Support planning:** each participant is actively involved in the development of their support plans. Support plans reflect participant needs, requirements, preferences, strengths, and goals, and are regularly reviewed.

Resources

Me and my medication - Council for Intellectual Disability (cid.org.au)

Me and my doctor - Council for Intellectual Disability (cid.org.au)

MedicineWise app - NPS MedicineWise

Keep track of medicines and access important health info anytime and anywhere, especially in emergencies.

Medicine Finder, NPS medicine wise

Search medicine by active ingredient or brand name. Learn more about many types of medicines that are prescribed or recommended for treatment. Learn more about getting the most from your medicines.

Symptom Checker | healthdirect

Safe use of mental health medications | healthdirect

Risks associated with benzodiazepines, SA Health

Benzodiazepines - Better Health Channel

Opioid medicines - safety, prescribing, side effects | healthdirect

Opioid medicines and chronic non-cancer pain - NPS MedicineWise

Psychotropic Medication Resources (unsw.edu.au)

Opioids_Narcotics+for+chronic+pain.pdf (squarespace.com)

Epilepsy Management Plans and Emergency Medication Plans

Epilepsy Management Plans and Emergency Medication Plans, Epilepsy Foundation

Seizure Management Planning, Epilepsy Action Australia

Epilepsy Management Plan and Emergency Medication Plans, Epilepsy Smart Schools

Emergency Management Plan - Epilepsy Queensland

References

Alexander R, Devapriam A, Roy A, Sheehan R (2016) *Psychotropic drug prescribing for people with intellectual disability, mental health problems and/or behaviours that challenge: Practice guidelines*, Royal College of Psychiatrists – Faculty of Psychiatry of Intellectual Disability.

Algera MK, Olofsen E, Moss L, Dobbins RL, Niesters M, van Velzen M, Groeneveld GJ, Heuberger J, Laffont CM and Dahan A (2021) 'Tolerance to opioid-induced respiratory depression in chronic high-dose opioid users: A model-based comparison with opioid-naïve individuals', *Clinical Pharmacology and Therapeutics*, *109*(3), 637–645, https://doi.org/10.1002/cpt.2027.

Australian Commission on Safety & Quality in Health Care (2018) *Hospital-acquired complications – Medication complications*, retrieved from https://www.safetyandquality.gov.au/sites/default/files/migrated/SAQ7730_HAC_Factsheet_MedicalComplications_LongV2.pdf.

Bateman JT, Saunders SE and Levitt ES (2021) 'Understanding and countering opioid-induced respiratory depression', *British Journal of Pharmacology*, https://doi.org/10.1111/bph.15580.

Bénard-Laribière A, Noize P, Pambrun E, Bazin F, Verdoux H, Tournier M, Bégaud B, and Pariente A (2016) 'Comorbidities and concurrent medications increasing the risk of adverse drug reactions: prevalence in French benzodiazepine users', *European Journal of Clinical Pharmacology*, 72(7), 869–876, https://doi.org/10.1007/s00228-016-2044-y.

Dahan A, Aarts L, and Smith TW (2010) 'Incidence, reversal, and prevention of opioid-induced respiratory depression', *Anesthesiology*, 112, 226–238, https://doi.org/10.1097/ALN.0b013e3181c38c25.

Gupta A, Prasad A, Nagappa M, Wong J, Abrahamyan L, Chung F (2018) 'Risk factors for opioid-induced respiratory depression and failure to rescue: A review', *Current Opinion in anaesthesiology*, 31(1): 110-19.

Horlocker T, Burton AW, Connis RT, Hughes SC, Nickinovich DG, Palmer, CM, Pollock JE, Rathmell JP, Rosenquist RW, Swisher JL, and Wu CL (2009) Practice guidelines for the prevention, detection, and management of respiratory depression associated with neuraxial opioid administration. Anesthesiology (Philadelphia), 110(2), 218–230, https://doi.org/10.1097/ALN.0b013e31818ec946.

Jay MA, Thomas B, Nandi R, and Howard R (2017) 'Higher risk of opioid-induced respiratory depression in children with neurodevelopmental disability: a retrospective cohort study of 12 904 patients', *British Journal of Anaesthesia : BJA*, *118*(2), 239–246, https://doi.org/10.1093/bja/aew40.

Jungquist CR, Smith K, Nicely KW, and Polomano RC (2017) 'Monitoring hospitalized adult patients for opioid-induced sedation and respiratory depression', *American Journal of Nursing*, 117 (3), S27-S35, doi:10.1097/01.NAJ.0000513528.79557.33.

Matos A, Bankes D, Bain K, Ballinghoff T, Turgeon J (2020) 'Opioids, polypharmacy, and drug interactions: A technological paradigm shift is needed to ameliorate the ongoing opioid epidemic', *Pharmacy, 8*(3): 1-19.

McTague A, Martland T, Appleton R (2018) 'Drug management for acute tonic-clonic convulsions including convulsive status epilepticus in children (Review)', *Cochrane Database of Systematic Reviews*.

NSW Health (2006) *Health care in people with intellectual disability – Guidelines for general practitioners*, retrieved from https://www.aci.health.nsw.gov.au/__data/assets/pdf_file/0016/231514/Health_Care_in_People_with_Intellectual_Disability_Guidelines.pdf.

Savelloni J, Gunter H, Lee KC, Hsu C, Yi C, Edmonds KP, Furnish T and Atayee RS (2017) 'Risk of respiratory depression with opioids and concomitant gabapentinoids', *Journal of Pain Research*, *10*, 2635–2641, https://doi.org/10.2147/JPR.S144963.

Schug SA, Palmer GM, Scott DA, Alcock M, Halliwell R, Mott JF, APM: SE Working Group of the Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine (2020) *Acute Pain Management: Scientific Evidence (5th edition)*, ANZCA & FPM, Melbourne.

Sullivan W, Diepstra H, Heng J, Ally S, Bradley E, Casson I, Hennen B, Kelly M, Korossy M, McNeil K, Abells D, Amaria K, Boyd K, Gemmill M, Grier E, Kennie-Kaulbach N, Ketchell M, Ladouceur J, Lepp A,

… Witherbee S (2018) ‘Primary care of adults with intellectual and developmental disabilities: 2018 Canadian consensus guidelines’, *Canadian Family Physician, 64*(4), 254–279.

Thi Le T, Park S, Choi M, Wijesinha M, Khokhar B, Simoni-Wastila L (2020) ‘Respiratory events associated with concomitant opioid and sedative use among Medicare beneficiaries with chronic obstructive pulmonary disease’, *BMJ Open Respiratory Research, 7*(1): 1-9.

Zedler B, Xie L, Wang L, Joyce A, Vick C, Brigham, J, Kariburyo F, Baser O, and Murrelle L (2015) ‘Development of a risk index for serious prescription opioid-induced respiratory depression or overdose in veterans’ health administration patients’, *Pain Medicine (Malden, Mass.)*, *16*(8), 1566–1579. https://doi.org/10.1111/pme.12777.

General enquiries

Call: 1800 035 544 (free call from landlines). Our contact centre is open 9.00am to 4.30pm in the NT, 9.00am to 5.00pm in the ACT, NSW, QLD, SA, TAS and VIC Monday to Friday, excluding public holidays.

Email: contactcentre@ndiscommission.gov.au

Website: www.ndiscommission.gov.au